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TITLE: **MODULAR STACKABLE FENCE APPARATUS**

September 19, 2006

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Sir:

Please find enclosed herewith a certified copy of the priority document, Canadian patent application 2,433,743, to be filed for this case.

Respectfully submitted,

Date: Sept 19/06


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Specification and Drawings, as originally filed, with Application for Patent Serial No:
2,433,743, on June 27, 2003, by MICHAEL J. ALBERTS, for "Modular Stackable Fence
Apparatus".

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ABSTRACT

1
2 A unitary stackable fence module having end assemblies and span
3 members is provided for forming a perimeter fence having an inwardly inclined
4 profile. A right angle end support has vertical and horizontal members and an
5 angle arm, spaced from and attached to a side edge of the vertical and horizontal
6 members adjacent the span members. The unique arrangement permits a
7 plurality of fence modules to be stacked for transport or storage. Loops formed on
8 the vertical members permit pivotal pinning of fence modules together to form
9 perimeter fences of any polygonal shape.

1 **"MODULAR STACKABLE FENCE APPARATUS"**

2 FIELD OF THE INVENTION

3 The invention relates to fence structures formed from modular
4 assemblies and more particularly to modular fence assemblies that can be
5 stacked for transport.

6 BACKGROUND OF THE INVENTION

7 It is known to provide perimeter fence structures around
8 installations such as an oilfield drilling site or wellhead. The perimeter fence must
9 effectively prevent animal encroachment, particularly by cattle, as many of these
10 installations are found on agricultural range land.

11 Cattle are known to rub against conventional fencing, such as wire
12 or wire mesh panels having vertical posts. Over time, the constant rubbing results
13 in damage and disruption of the integrity of the fence.

14 Further, modular fence structures are typically moved from site to
15 site such as when drilling ends or wells no longer produce. Thus, it is of some
16 considerable importance that the perimeter fence structures are modular and are
17 easily transported in conventional pickup trucks or on towed trailers. Onsite,
18 access to the enclosed installation may be required by large equipment such as
19 service rigs. It is advantageous if the fence assemblies are readily connected and
20 disconnected from each other to provide access when required.

21 As many drilling sites are located in areas which are subject to
22 below-freezing ambient temperatures, it is also important that the modular
23 assemblies used to create the perimeter fence are not secured to the ground in
24 such a fashion that the fastenings become frozen into the ground. Removal of

1 frozen fastenings often results in damage to both the fastenings and to the fence
2 assemblies.

3 US Patent 5,533,714 to St. John teaches a modular fence
4 apparatus for use in constructing a perimeter fence to prevent entry of animals
5 and cattle into the fenced area. The fence apparatus comprises flat panels with
6 span members. The flat panels are connected to discrete corner assemblies that
7 are angled so as to set each panel at an angle. The panels are angled inward
8 along a top edge. Further, the corner assemblies have span members connected
9 between frame members to form triangular angled corner panels. While the flat
10 panels are easily stacked for transport, the corner assemblies, which comprise
11 three upright posts, 2 angled top members and the span members, are awkward
12 and not readily stacked. Each flat panel must be connected at each end to a
13 corner assembly using fasteners when the perimeter is assembled and similarly,
14 fasteners must be removed to gain access for large equipment or for
15 disassembly. If the perimeter fence is required to be other than rectangular,
16 separate corner assemblies would be required having various preset angles.

17 Canadian patent 1,091,968 to Hillman teaches a perimeter fence
18 having generally vertically disposed rigid post members which have a lower
19 portion that engages the ground and an upper, inwardly inclined portion to which
20 the rails are attached. At least one of the rails is disposed at the height of the
21 average bovine knee to prevent leaning or rubbing. Rails, extending at right
22 angles to the corner posts, are welded or otherwise fastened to the corner posts.
23 The rails are split mid-span and connected by welding, by removable fasteners or
24 the like. Clearly, assembly on site requires significant time and effort. If formed as
25 modules having the rails pre-welded to the corner posts, each module is relatively

1 large and cumbersome. Transport of the modules would be awkward and the
2 number of modules that could be transported at any one time may be limited. As
3 with the perimeter fence of St. John, changes in the shape of the fence would
4 require welding the rails to the corner posts at a variety of angles, necessitating
5 on-site assembly or stocking of a number of different modules.

6 Clearly, what is required is a modular fence assembly that can be
7 readily stacked for transport in a truck bed. Further, the modules should require a
8 minimum of assembly on site and allow for forming a perimeter fence of whatever
9 shape is required for each unique location. Preferably, the fence should be easily
10 opened for access to large equipment such as a service rig.

SUMMARY OF THE INVENTION

A fence module for forming a perimeter fence is provided. The fence module has two end assemblies connected by span members. The end assemblies comprise a vertical member connected at a lower end to a first end of a horizontal member and an angle arm connected between an upper end of the vertical member and a second end of the horizontal member. The angle arm is connected to a side edge of the vertical and horizontal members to permit sufficient space to allow successive fence modules to be stacked for transport and storage.

In a preferred embodiment of the invention, a spacer means is positioned between the angle arm and the vertical and horizontal members to provide additional tolerance resulting in the ability to stack large numbers of fence modules without restriction.

Successive fence modules are readily fastened to each other for forming a perimeter fence, without the need for additional structural elements. Attachments means, preferably loops, are spaced along the vertical members of the end assemblies. Preferably the loops on a second end support of a first fence module are spaced to co-operate with the loops on a first end support of a subsequent fence module to permit vertical alignment of the loops to allow passage of a pin therethrough. Thus, the fence modules are pivotally attached to one another and rotation about the pin allows the fence modules to be arranged at infinite angles permitting forming perimeter fences having a number of polygonal shapes.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1a is a perspective view of one embodiment of a fence module of the present invention assembled into a rectangular perimeter fence;

Figure 1b is a perspective view of one embodiment of a fence module of the present invention assembled into a triangular perimeter fence;

Figure 2a is a partial side view of a fence module according to Fig. 1a,

Figure 2b is a close up view of the detail of the connection between a right angle corner brace and an angle arm according to Fig. 2a;

Figure 3 is a partial perspective view of a first fence module pivotally attached to a subsequent fence module illustrating the attachment detail;

Figures 4a-c are front schematic views of a plurality of fence modules according to Fig. 1a, illustrating the stackability of the modules, more particularly, Fig. 4a is a plurality of modules prior to stacking, Figs. 4b and Fig. 4c illustrate the relationship between modules as the modules are stacked; and

Figures 5a-b, are side schematic views of a plurality of fence modules according to Fig. 1a, more particularly, Fig. 5a is a plurality of modules prior to stacking and Fig. 5b illustrates the relationship between successive right angle corner braces and angle arms as the modules are stacked.

1 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

2 Having reference to Fig. 1a, a perimeter fence 1, formed using
3 unitary stackable fence modules 2 of one embodiment of the present invention, is
4 shown.

5 As shown in Figs 1a - 3, each fence module 2 comprises two
6 delimiting end supports 3 spaced by a plurality of span members 4 attached
7 therebetween. Each end support 3 has a substantially vertical member 5, a
8 horizontal member 6 connected at a first end 7 to a lower end 8 of the
9 substantially vertical member 5 and an angle arm 9 connected between an upper
10 end 10 of the substantially vertical member 5 and a second end 11 of the
11 horizontal member 6. The end supports 3 act as braces to support the span
12 members 4. The span members 4 are connected at each end to the angle arms 9
13 creating an upwardly and inwardly inclined fence module 2, suitable for
14 preventing intrusion and damage by animals and livestock. The span members 4
15 are spaced so as to have at least one span member 4 positioned at about the
16 height of the average bovine knee and at least one span member positioned at
17 about the height of the chest. In this way, livestock are discouraged from
18 attempting to step over the fence 1 and, because of the inward incline, are not
19 inclined to lean or rub against the span members 4.

20 Further, best seen in Figs. 1a-b and 3, when a first fence module 20
21 is attached to a subsequent fence module 21, the adjacent end supports 3 act to
22 form a corner 22. The perimeter fence 1 is shown having a square shape (Fig.
23 1a), however, it will be appreciated by those skilled in the art that adjacent
24 modules 20,21 can be pivoted at the corner 22 and the perimeter fence 1 can be

1 formed in any number of polygonal shapes using three or more fence modules 2
2 (Figs. 1a-b).

3 As shown in Figs. 2a, 4a-c and 5a-5b, and in a preferred
4 embodiment of the invention, the angle arm 9 is connected to the vertical
5 member and to the horizontal member at inside side edges 12,13 adjacent the
6 span members 4. This arrangement of vertical members 5, horizontal members 6
7 and angle arms 9 permits stacking of a plurality of fence modules 2.

8 Preferably, as shown in Figs. 2b and 4a-c, a spacer means 14 is
9 positioned between both the substantially vertical member 5 and the horizontal
10 member 6, and the angle arm 9 at points of connection 15 to provide additional
11 dimensional tolerance, permitting a large number of substantially identical
12 modules 2 to be stacked without restriction.

13 As shown in Fig. 3, attachment means, such as and preferably
14 loops 16, are attached to each substantially vertical member 5 to permit pivotal
15 attachment of the first module 20 to the subsequent module 21. The loops 16 on
16 each of the first and subsequent module are positioned to be aligned vertically to
17 accept a pin 17 to be passed therethrough. Thus the modules 20, 21 can be
18 rotated about the pin 17 to form a corner 22 having an infinitely variable angle for
19 forming different shaped perimeter fences 1.

20 Pins 17 used to attach subsequent modules 20,21 can be of
21 sufficient length to permit penetration into the ground to more securely affix the
22 perimeter fence 1 thereto. While some freezing of the pin 17 into the ground may
23 occur with low ambient temperatures, difficult removal of the pin 17 would result
24 in damage to the pin 17 only and not to the fence modules 2. This is a significant
25 improvement over prior art fence modules where the leg of the module is inserted

1 into the ground resulting in a need to repair the fence module should damage
2 occur when removing the leg from frozen ground.

3 More preferably, each fence module 2 has a first end support 3,23
4 and a second end support 3,24. The second end support 3,24 of the first module
5 20 has loops 16 spaced to co-operate with loops 16 on the first end support 3,23
6 of the subsequent fence module 21.

7 In the preferred embodiment, the end supports 3,23,24 and the
8 span members 4 are formed of tubular steel which are welded to form each fence
9 module 2.

10 Additionally, as shown in Fig. 1a, at least one fence module 2 is
11 formed having a man-door or gate 30, intermediate the span members 4, to
12 permit access by personnel at the site. A pair of support posts 31 are positioned
13 intermediate the span members 4 and extend from a top span member 32 to the
14 ground and at an identical angle to that of the angle arms 9. A horizontal base
15 member 33 extends between the support posts 31 at a lower end 34 of each of
16 the support posts 31. The gate 30 is connected to one of the support posts 31 by
17 two or more hinges 33.

18 Large equipment can readily gain access within the perimeter fence
19 1 by removing one of the pins 17 and pivoting one or both of the fence modules 2
20 to open the perimeter fence 1.

1 **THE EMBODIMENTS OF THE INVENTION IN WHICH AN**
2 **EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS**
3 **FOLLOWS:**
4

5 1. A unitary, stackable fence module comprising:

6 two end supports, each end support having a substantially vertical
7 member connected at a lower end to a first end of a horizontal member and an
8 angle arm connected between an upper end of the substantially vertical member
9 and a second end of the horizontal member; and

10 a plurality of span members connected between the angle arm of
11 each end support, spacing the end supports apart,

12 wherein, the angle arm is attached to a side edge of each of the
13 substantially vertical and horizontal member adjacent the span members to
14 permit stacking of two or more unitary fence assemblies for storage or transport,
15 the angle arms of each successive module fitting between the horizontal and
16 substantially vertical members of a previous module.

17
18 2. The unitary, stackable fence module of claim 1 further
19 comprising a spacer positioned between the angle arm and the side edge of the
20 vertical and horizontal members for providing additional tolerance between each
21 modules for stacking.

1 3. The unitary, stackable fence module of claim 1 further
2 comprising a first end support and a second end support, each of the first and
3 second end assemblies having attachment means attached to the vertical
4 member to permit pivotal attachment to a subsequent fence module,

5 wherein the means on the second end support of a first module co-
6 operate with the means on the first end support of the subsequent fence module;
7 and

8 the first module and subsequent module are rotatable about the
9 pivotal attachment for forming a corner.

10

11 4. The unitary, stackable fence module of claim 3 wherein the
12 means for pivotal attachment comprises a pin and loops arranged along each
13 vertical member so as to permit vertical alignment of the loops between the
14 second end of the first fence module and the first end of the subsequent fence
15 module to permit passage of the pin therethrough.

16

17 5. The unitary, stackable fence module of claim 4 wherein the
18 pin is of sufficient length to engage the ground at the lower ends of the attached
19 vertical members.

20

21 6. The unitary, stackable fence module of claim 1 wherein the
22 end assemblies and the span members are formed of tubular steel.

23

1 7. The unitary, stackable fence module of claim 1 further
2 comprising a man door formed intermediate the span members for permitting
3 access.

4
5 8. A perimeter fence formed using a plurality of unitary,
6 stackable fence modules according to claim 3, wherein first and subsequent
7 fence modules are pivotally connected to form a polygonal shape.

8

1 9. A modular fence system for forming a polygonal perimeter
2 fence comprising:
3 three or more stackable fence modules, each module comprising
4 two end supports, each end support having a substantially
5 vertical member connected at a lower end to a first end of a horizontal
6 member and
7 an angle arm connected between an upper end of the
8 substantially vertical member and a second end of the horizontal member;
9 and a plurality of span members connected between the angle arm of
10 each end support, spacing the end supports apart, wherein, the angle arm
11 is attached to a side edge of each of the substantially vertical and
12 horizontal member adjacent the span members to permit stacking of two
13 or more unitary fence assemblies for storage or transport, the angle arms
14 of each successive module fitting between the horizontal and substantially
15 vertical members of a previous module; and
16 means for pivotal attachment, connected to each of the two end
17 supports of each of the three or more fence modules, for pivotally connecting
18 each of the three or more fence modules to an adjacent fence module for forming
19 the perimeter fence.
20

1 10. The modular fence system as described in claim 9 wherein
2 each of the three or more fence modules further comprises
3 a first end support and a second end support, and
4 wherein the means for pivotal attachment on the second end
5 support of a first module co-operate with the means for pivotal attachment on the
6 first end support of a subsequent fence module; and
7 the first module and subsequent module are rotatable about the
8 pivotal attachment means for forming a corner.

9
10 11. The unitary, stackable fence module of claim 9 wherein the
11 means for pivotal attachment comprises a pin and loops arranged along each
12 vertical member so as to permit vertical alignment of the loops between the
13 second end of the first fence module and the first end of the subsequent fence
14 module to permit passage of the pin therethrough.

15
16 12. The unitary, stackable fence module of claim 11 wherein the
17 pin is of sufficient length to engage the ground at the lower ends of the attached
18 vertical members.

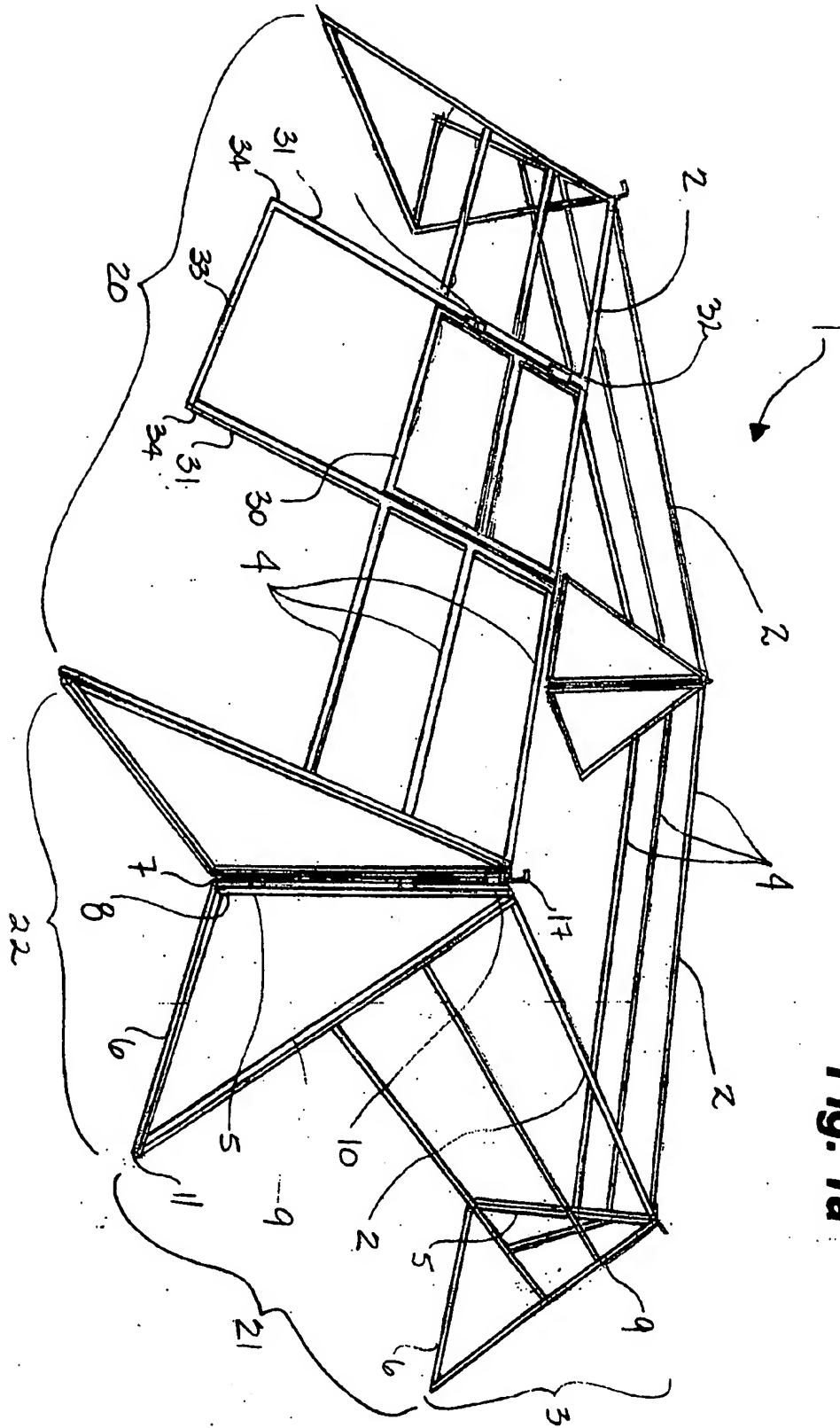


Fig. 1a

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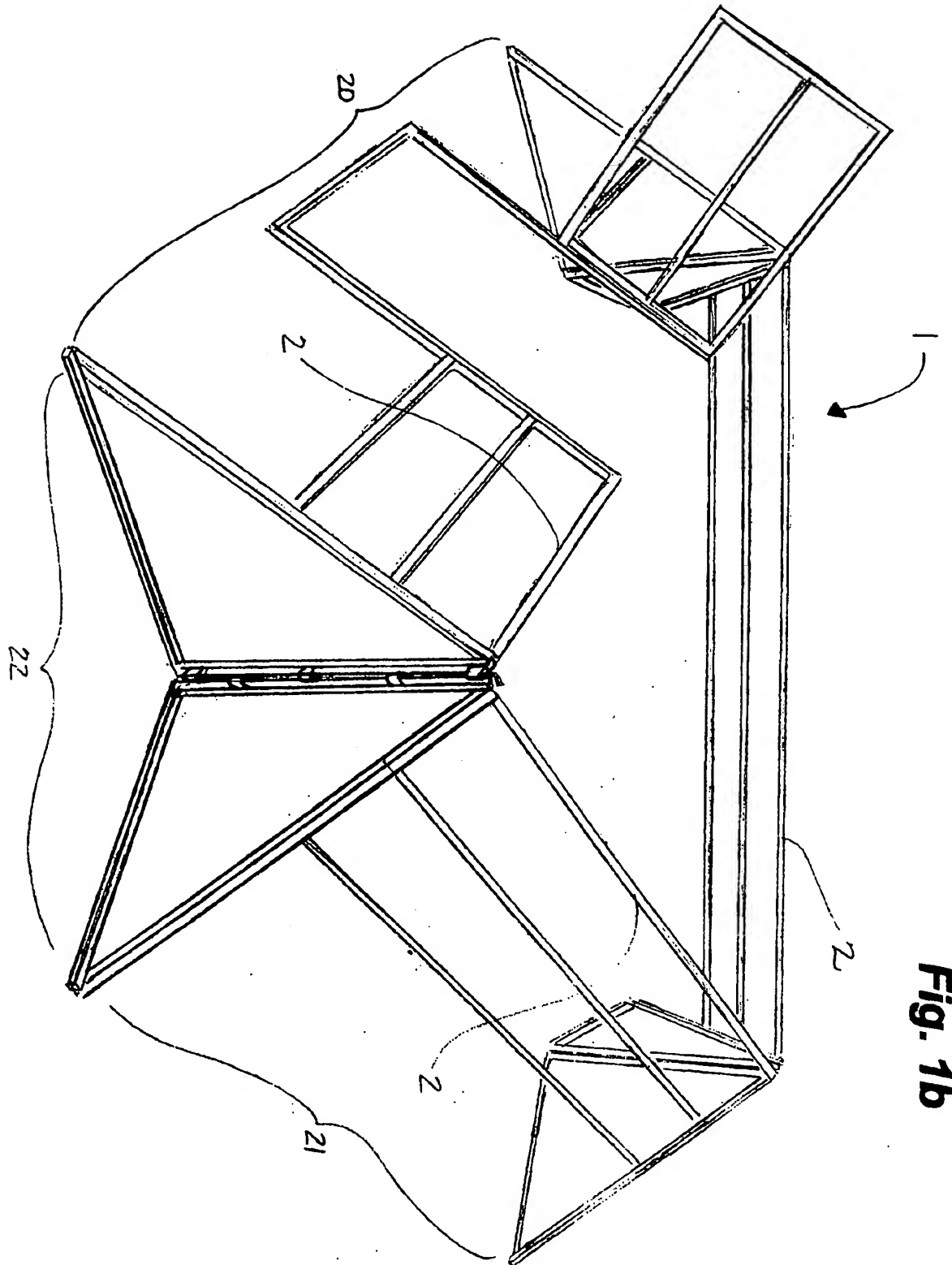


Fig. 1b

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Fig. 2b

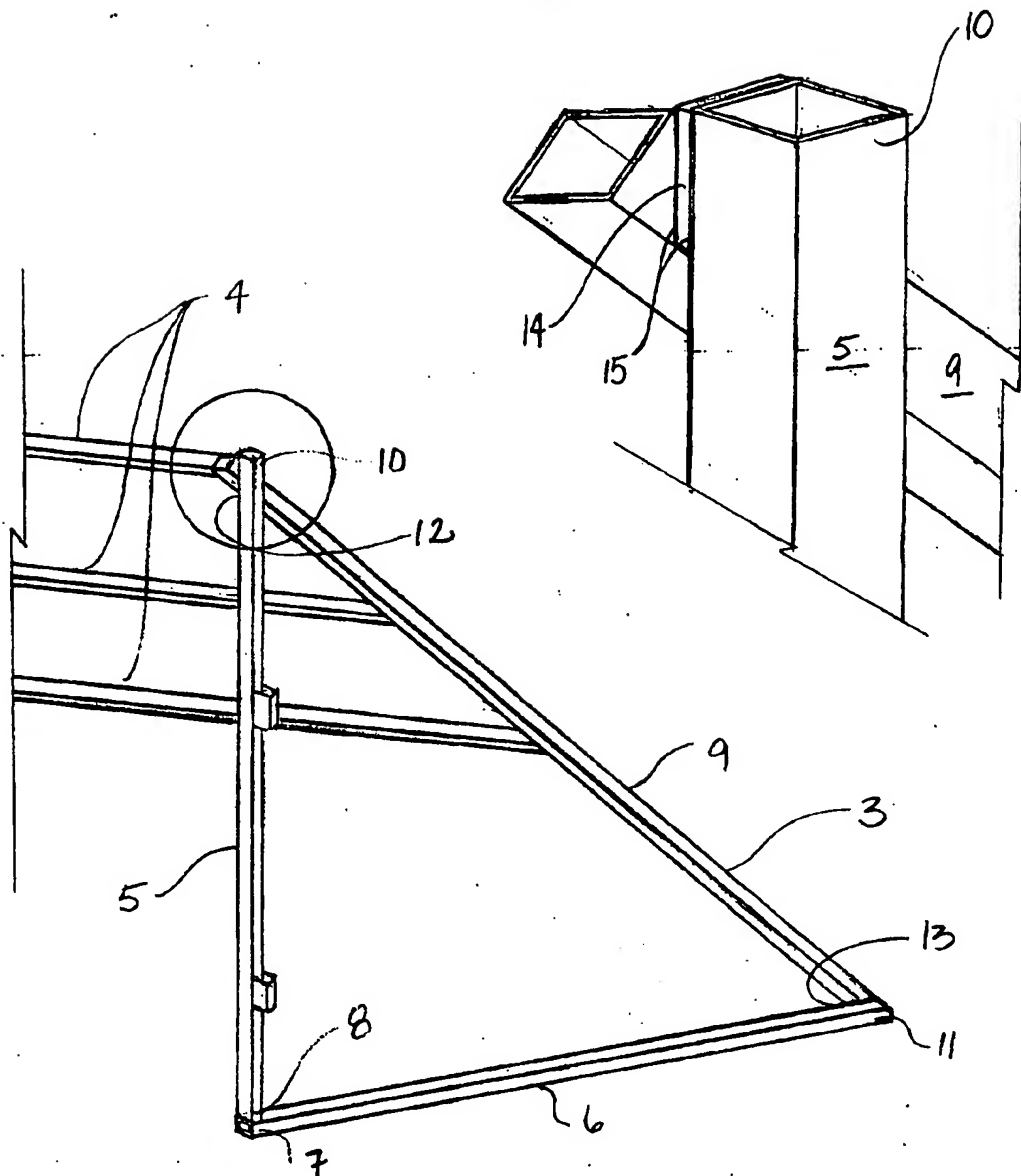
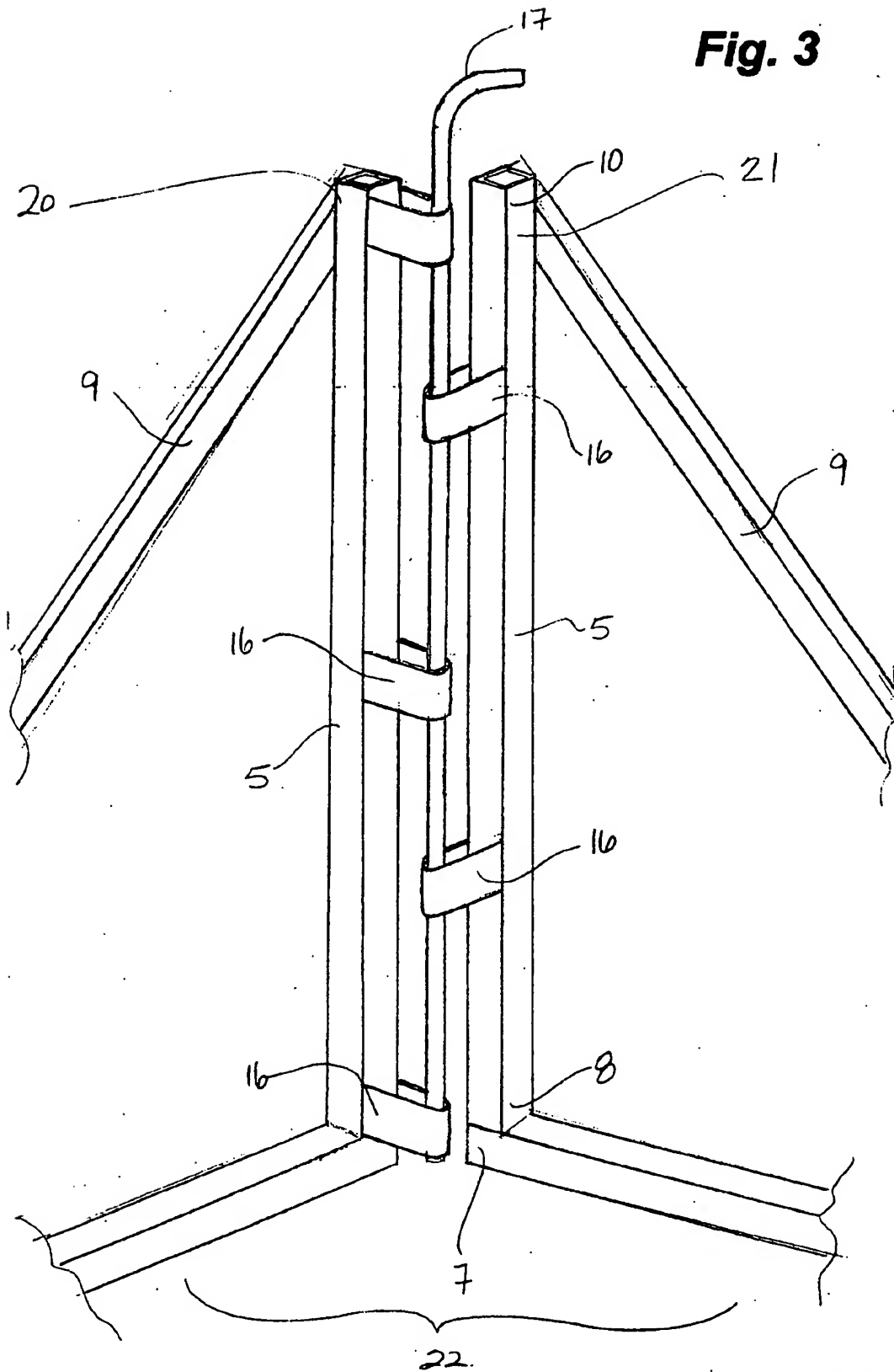


Fig. 2a

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Fig. 3



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Fig. 4a

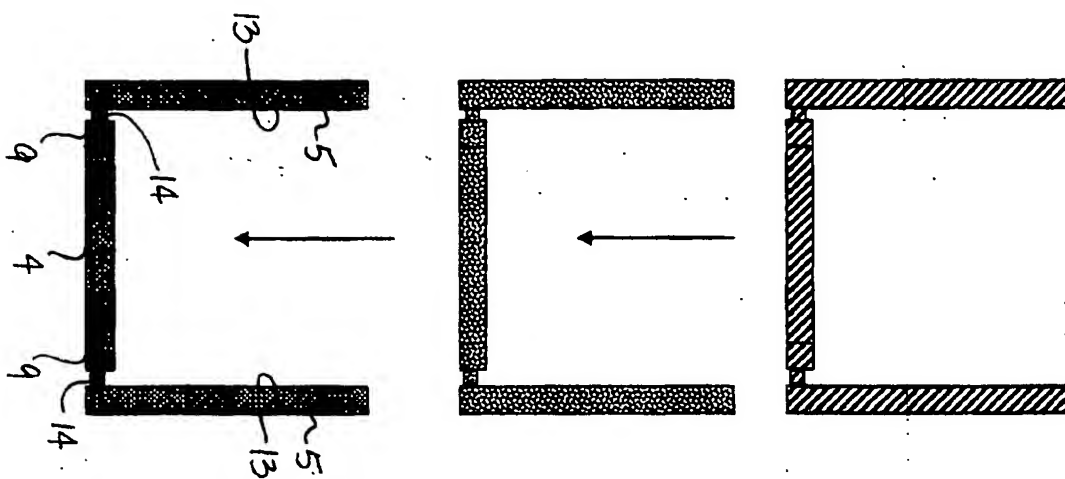


Fig. 4b

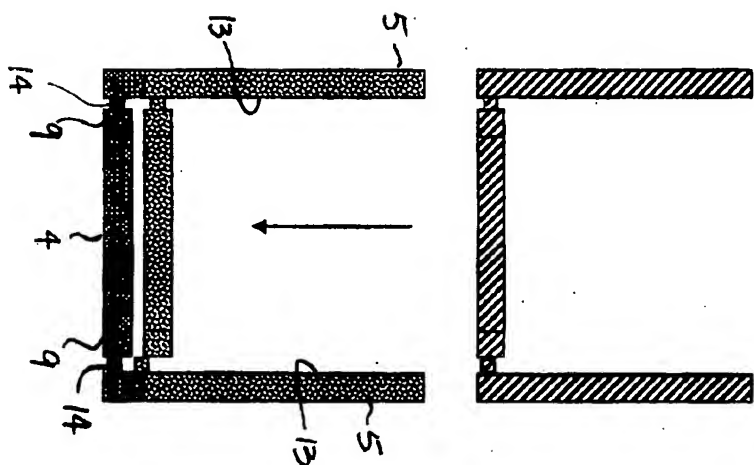
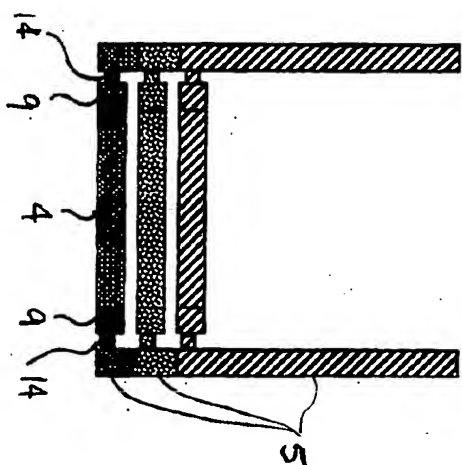


Fig. 4c



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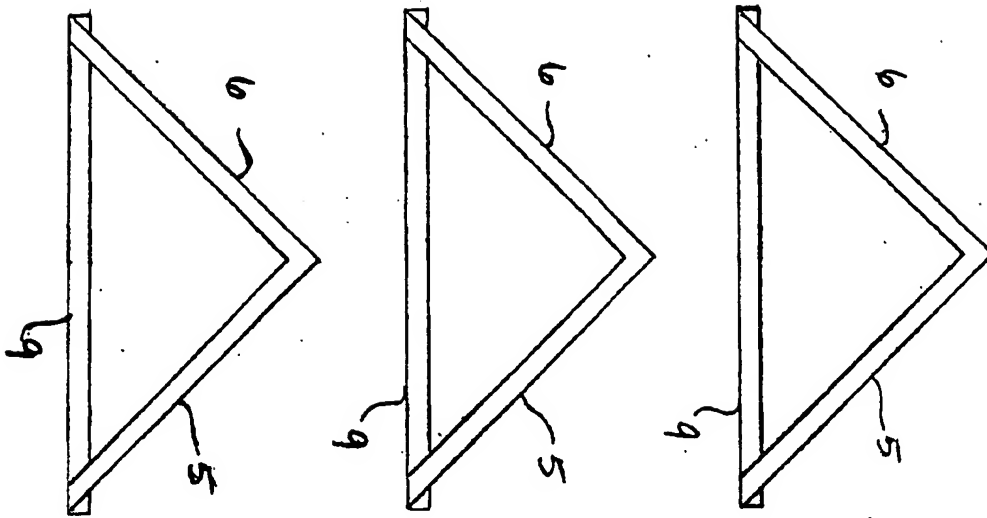


Fig. 5a

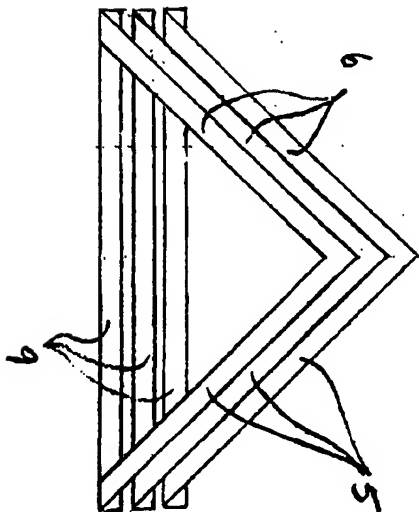


Fig. 5b

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